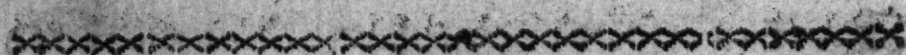




A  
DISSERTATION  
ON THE  
ERRORS OF MARKSMEN, &c.



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A  
DISSERTATION  
ON THE  
ERRORS OF MARKSMEN  
AND  
GUNMAKERS,  
AND A  
TRACT  
UPON THE  
Art of Shooting Flying;  
WITH AN  
ESSAY  
On POINTERS and FLUSHERS,  
AND  
REMARKS  
Upon RIFFLE GUNS and METHODS  
of SHOOTING with them.

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By that most able PARK and GAME-KEEPER and  
famous MARKSMAN,

Mr. LEMON. R

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T H E  
A R T  
O F  
S H O O T I N G.

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I HOPE, as there is no compatibility in the practice of Shooting and that of Writing, nor in searching the repositories of scientific and polite literature, and superintending parks and forests : that the criticks will not trouble their heads with any literary performance of mine ; and, as the motive that induced me to write the following Tract, springs from the desire I have to render myself serviceable to my brother sportsman, in facilitating the Art of Shooting Flying ; I hope that the faint rays of light which emit from my

my feeble pen, will spread so diffusive over the mysterious parts of that art, as to make obvious to my Readers the principal causes of the flying marksman missing the object of his aim, and thereby render an art easy attainable to them, which very few have ever yet obtained, in an eminent degree of perfection, nor made any proficient acquisition of it proportionate to the time they have followed it, or adequate to the practice they have had in it.

It has been often justly observed, that there is not, in any art exercised by men, so great a number of practitioners and so few proficients, as in the art of shooting flying. The adepts in this art are so few, that there is not one in a thousand can say that he knows one half of the causes of missing, nor boast that he is certain of hitting a bird upon wing, at any one distance, nor in any one line of direction: nor one in five thousand of the oldest, the most expert, and most certain shots, able to convey, by mechanical demonstration or observation, any instructive idea of the art to a young sportsman. They shoot and they kill, and at some periods kill often, and at others as oft miss; but are no ways able to explain in any instructive



fructue terms how it is they kill, nor by what error they miss : so that the art of shooting flying seems to have been practised hitherto without any rule, or mechanical observation ; and marksmen in general, instead of having at their initial, practical rules laid before them for a guide, have been left to wander in the dark, or in a situation next in affinity to darkness, having no light but that which sprung spontaneously from their own ideas ; and many of them have been twenty or thirty years in finding out, by dint of laborious practice, that which they might have learnt in half an hour from the oral or written instructions of an able tutor. I mean by the expression able tutor, one, who from the theory and practice of the art of shooting flying, hath gleaned such a general knowledge of the causes of missing volant objects, and has found out such indefectible rules for hitting them, as to be able to shoot flying, with the same certainty of hitting as of hitting fixed objects ; and is capable of giving such lessons, in writing, or by word of mouth, as will capacitate those sportsmen who read or hear, with proper attention, to do the same. This is the man whom I call an able tutor : but unluckily for young sportsmen, no such tutor has

has made his appearance publicly since the birth of the art of shooting flying, neither has any thing transpired that indicates the existence of such tutor ; tho' several books have been published, intitled treatises upon that art ; books from divers quarters have appeared under the title of treatises upon the art of shooting flying, from which we can learn, that the authors had words at command, but we do not learn that they understood the causes of the flying marksman's missing the object of his aim ; or that they had any knowledge of the rules he should have recourse to, to be certain of hitting it.

The Clergyman of Suffolk has linked an abundance of words together under the before-mentioned title : but he has not unfolded any one of the causes of the marksman's missing birds upon wing, neither has he set down any rules for hitting them, nor has not so much as shewn us those lines of direction, in which they are easiest or most difficult to hit. So far is the Clergyman of Suffolk, and others his brother authors (who have wrote upon the art of shooting flying) from developing the causes of the marksman's missing volant objects, that they have not recited any one of the least or most prin-



principal ones ; and so far from prescribing rules for hitting them, that they severally assert there are no rules for shooting flying. This shews the hands of those authors were never much employed in the practice of that art, and that they never had had it under any strict disquisition. Had they been experienced and skillful practitioners in shooting flying, and had taken proper notice of matters in the course of their practice, they would have discovered there were aphorisms in that art as well as in other arts and sciences. They would have found there were certain general rules to be observed in the practice of shooting flying, and the choice of guns, for that purpose, rules so essential to that art, that no sportsman can be a marksman without a knowledge of and strict adhesion to them. I do not pretend to say but that a sportsman may kill a good deal of game without any attention to rule, or knowledge of the various causes of missing. A stout active man who has nothing else to do but follow shooting, may, with perseverance and a capacious magazine of powder and shot, blunder down a great many birds, in the course of a season, where there is a plenty, without adhering to or knowing any one rule in or belonging to

the art of shooting flying, and without insight of the numerous causes of missing ; and he may by labouring hard, twenty or thirty years with his gun in the field, learn (without hearing or reading any thing about the causes of missing or rules for hitting flying objects) to be so certain of hitting birds that get up at some particular distances, and fly in some particular lines of direction, as to be able to kill game enough for any individual, This he may do, and at the same time be very remote from the good marksman. It is impossible for any man to get master of the art of shooting flying (begin his efforts ever so early, or be ever so vigilant) before decrepit age steals upon him ; before the evil days come when he will have no pleasure in his gun besides that of talking of it, unless he hears or reads lessons upon the causes of missing and rules for hitting volant objects, at some period or another. Without theoretical knowledge of the causes of missing and rules for hitting birds upon wing, the marksman must inevitably be flurried, confused and lost in the exercise of shooting flying ; and error, disorder and disappointment must of course await him, in some part or another of his practice, in that art, till the latest hour of his sporting days.

I am



I am not going to tell you that I am superior to all the universe in the knowledge and practice of shooting flying, or that I am the best tutor alive in that art, or that what I have said about it, in the following sheets, surpasses all the publications now extant upon it. But I dare venture to say that I am as good a shot as any that can, at this period be found; but whether I am so able an instructor as any, I leave my readers to judge.

As the marksman's dependance rests much on the goodness of his gun, I shall take that instrument in hand first, and point out the errors many of them commit in their choice of guns; also the errors committed by gun-makers in the facture of them; and endeavour to shew the inconveniencies that attend such erroneous choice; likewise the inconveniencies that accrue from the false ideas of the makers; and proceed to give a description of the gun which I have, by experience, found to be the best. There is among the several errors committed by sportsmen in the choice of guns, one almost universal, which is the flexure of the stock. There is not one sportsman in fifty, but chuses a very crooked stock: whatever errors they commit in their choice in other points, the bending of the stock is almost certain to be one. Some chuse a long  
barrel

barrel with it, others a very heavy one, others a very light one, and others a barrel with a wide bore, and now and then one chuses a barrel with a protuberant muzzle; but whether it is the marksman's choice to have a protuberant muzzle, or not, the gun-maker generally takes care to furnish him with one; for the major part of these mechanics, in England, are so much biaſſed in favour of a protuberant muzzle, that they reckon it the primary beauty of the barrel, and think a gun awkwardly finished that is without it, and its usual appendage, a large sight. This prejudice was so prevalent amongst English gun-makers, a few years ago, that you could not get a gun out of their hands with a slender muzzle; not even if you stood by them while finishing it, praying to have it slender. I have been many times a witness of and have experienced this ridiculous obstinacy of gun-makers; and have been obliged to file away the extuberance of the muzzles of several new barrels, sometimes cut the muzzle quite off before I could shoot with the gun, with any degree of certainty of the hitting a bird upon wing; so that this error (from whomsoever it had its origin) seems to owe its existence, at this time, to the false ideas and stubbornness of the gunmakers. I have, in my time, been present when great numbers of orders have been  
given.



given by sportsmen, to gunmakers, for new guns but I cannot recollect that I ever knew of above one wherein the maker was desired to make a gun with a protuberant muzzle ; one I have certainly seen in which the gunmaker was desired to make the muzzle very large and spreading. This order being altogether a very peculiar one, and extravagantly erroneous, curiosity excited me to take an abstract of it, the substance of which I shall here recite, by way of example, or as an instance of the sportsman's erroneous choice, which were as follows : The bending of the stock to be four inches and a half; the length of the barrel three feet ten inches, the muzzle one fourth more in diameter than the middle part of the barrel ; the sight a quarter of an inch high and a quarter of an inch thick, and a deep gutter cut upon the breech to look thro' when taking aim. There needs no argument to prove that the purport of this order were totally wrong, and that the gun depicted in it, is, in every point diametrically repugnant to the form in which it ought to be made for shooting flying. The extreme flexure of the stock, the protuberance of the muzzle, the size of the accretion, called a sight, upon it, together with the gutter upon the breech, all conspire to make the gun throw its charge under the visual line of the mark.

marksman's aim ; and the superfluous length of the barrel is certain to be adminicular too, in bringing the shot under the mark. Guns in general, even those which in the construction, approach nearest to the form in which they should be made, are remote from a right shape : They are all made to throw their shot too much under the marksman's visual rays of aim, and experience has made it clear to me, beyond a doubt, that marksman miss more birds by shooting under them, than they do by all other errors, defects and incidents whatsoever. I have, in the course of my time, had the trial of a great number of guns, in shooting at fixed objects, such as cards, sheets of paper, &c. but I do not remember finding one in all my probatory shooting with them, that threw the center of its charge so high as the visual line of aim, at forty yards distance ; but I have found some scores that threw their shot so much under it, that there have been but very few particles so high as the object, when it has been a card or some other object of the same perimeter. If a gun throws the center of its shot so much below a fixed object, it must certainly throw it a great deal more under an object in motion, which elevates in its direction, as all birds of game generally do as long as they are within the marksman's



man's reach. There is not one bird in three-score, of any species of game you shoot at flying, but that is elevating at the time you fire at it; and some of them, (such as pheasants and partridges) frequently gain sixteen or eighteen inches in altitude, while your gun is in the action of firing and shot flying to the distance of five and thirty or forty yards; especially the cock pheasant, which often flies in a direction nearly verticle. Some sportsmen, very probably, may think, that the interval is so short, between the igniferous stroke of the lock and the appulse of the shot to an object at forty yards distance, that a bird has not time to gain any significant space, in its volant progression, in altitude, and that neither difficulty nor disadvantage can accrue to the marksman from the altitudinal celerity of the bird, nor from the defectiveness of his gun, in throwing the center of its charge under the visual line of aim. But I must beg leave to observe that such notions are erroneous. To be sure at the beginning of the season, before the birds are ripe in plumosity, or arrived at the zenith of their strength; when their celerity is torpid, and they lie before your pointers till you spurn them up; their elevation is then of little consequence; and a marksman, at this time

time, may, perhaps, with one of the beforementioned ill constructed guns, bring down now and then one of these flaccid and immature birds : he may, perhaps, drop one in three or four times shooting, whilst their impuissance renders them incapable of topping a hedge of a dozen foot high. But after the elapſion of a few weeks when their plumage is maturated ; and they are made ſo wary by inceſſant harraſſing, that they will not bear the preſence of your pointers a moment, nor permit your approach within five and twenty or thirty yards of them before they ſpring ; and when their fear and ſtrength of wing carry them off, with a rapid celerity, in lines elevating probably, to five and thirty or forty degrees, then you may poſſibly ſhoot ten times with your inhabile piece, before you draw blood or break a feather ; and, after a long days ſterile fatigue, go home with an empty bag, grumbling out the trite phraſe, the birds are exceedingly wild ; and never once ſuſpect that the defectivenes of your gun were the cauſe of miſſing them. The muſcle of a gun, (whether it be long or ſhort, heavy or light) with a very crooked ſtock, will incline towards the ground in ſpite of power or art, when the markſman preſents it, if he puts the but of the ſtock in its proper place againſt his



his shoulder; and instead of the barrel appearing full in his eye, as it should, from end to end when presented, he will be obliged to raise his head from its proper position, to get sight of it, and many precipitant shooters frequently fire with these awkward pieces, without seeing any part of the barrel at all, and shoot into the ground, at a few yards distance, when the bird is level with or above the horizon.

The most cool, deliberate, and most expert marksman will find his judgment often foiled, if he shoots with a gun constructed so as to have either a very crooked stock, a long barrel, a protuberant muzzle, or a sight upon the muzzle; either of these faults in his gun, will often cause him to miss, in spite of all his composure, serenity and skill.

It is a gross error to chuse a very crooked stock, or a long barrel; but more gross to chuse a protuberant muzzle, or a sight upon the muzzle. A sight on the muzzle of your gun is, instead of being a director, a very great obstruction to you in shooting flying, especially when it is large as many of these masses are. Some of these masses, called sights, are made so enormous, that they

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will

will, when you look along the barrel, with your gun presented, shade from your eye at forty yards distance, an object nearly as large as the body of any one of the feathered species called game, so that if the marksman aims full upon the bird he will be obliged to carry his visual rays quite over this mass in the point of his gun, otherwise he has no sight of it.

Had the gunmakers racked their invention, from the time of the facture or formation of the prototype of a gun, to the present period, to have found out a shape and an appendage for a gun barrel, to increase the marksman's difficulty in taking aim at birds upon wing, and avert his will and purposes in shooting at them, they could not, under any pretence to use or ornament, have hit upon any so efficient as the protuberant muzzle and sight.

Whatever the height of that mass, called a sight, may measure above the muzzle of the barrel, the marksman's error in shooting under a flying object, will be increased in proportion to that height, as often as he takes his aim from the upper part of the muzzle; for his ocular  
and



and mental faculties are too closely engaged and too fully employed, with and about the motion and direction of the bird; and the time he has to spend in optick observation, between presenting and firing, is so very short, that it is impossible for him to pay any attention to the nominal directory on the point of his gun.

The marksman, whenever he takes aim at any flying object, from the center of the upper part of the muzzle, carries his visual rays quite over the sight upon it, the same as if the superficies or extremity of the muzzle were equal or level with the height of that sight. So that this mass serves for no other purpose, than that of making your visual line of aim and the center of your shot more divergent than the protuberance of the muzzle would have done alone, and occasion you to shoot, probably twelve or fourteen inches more under the bird than you would have done had your barrel been without it.

I have frequently seen marksmen who could shoot well, and who have taken their aim accurately, and have held their gun during the action  
of

of firing with the greatest rectity to the mark, according to their visual line, shoot full two foot under the bird, at forty yards distance. How is it possible to be otherwise, when the birds elevation makes the line of its direction divergent from your visual line of aim upwards, and the low shooting of your gun, makes the center of your shot divergent from your visual line downwards. You may as well expect a collision of two cannon balls, one with another, which are shot from two different guns, one pointing due north and the other west, as for your shot to hit the bird when you see it above the muzzle of the barrel (with one of these low shooting guns) especially when the bird gets up at above five and twenty yards distance, and flies in a line elevating to twenty or thirty degrees. There is an hundred to one more certainty of killing with a gun that throws the center of its shot two foot above your visual line at forty yards distance, than there is with one that throws it but two inches under that line; because, you can in all directions that a bird flies, afford to see its whole body above the muzzle of such a gun; which enables you to make an allowance with certainty, for the space it throws the center of its shot above your visual line. But it is impossible for you  
to



to make an allowance for the space that a gun throws it below that line, or for the elevation of the bird, with any degree of certainty; especially when the bird springs at above five and twenty yards distance, and flies in a line elevating upon a direct line from you; because you are constrained by the laws of aiming, to pull full upon your bird, when flying in that line of direction; and you must lose sight of it to obtain any chance to kill it, with a low shooting gun, you must hold the muzzle of a gun, that throws the center of its charge under your visual line, to a point much above a bird that springs at thirty yards distance, and elevates in its direction to thirty degrees, to obtain any chance to bring it down; so that if such bird flies off upon a direct line from you, you cannot have sight of it when you pull, therefore cannot pretend to any certainty in making an allowance for its elevation, nor for the defectiveness of your gun in throwing its shot too low.

Besides, if such birds never flew off upon strait lines from you, but always directed their flight upon oblique or transverse lines; so that you might have them full in your eye from the time you engage them till you fire, you would  
have

have enough to do to encounter with their celerity on the horizon : you would find yourself sufficiently employed in bringing your body to a motion correspondent with the motion of the bird, so as to traverse your gun concordant with its celerity on the horizon, and measure the distance or space, that its horizontal speed required you to allow, in aiming before it, or head of it, without being perplexed with the arduous task of making an allowance for the defectiveness of your gun, in throwing its shot too low, or burthened with the difficulty of allowing for the birds celerity in altitude. Many young sportsmen have been baffled and retarded in learning the art of shooting flying, by using these low shooting guns ; for they by their often missing, (as the best marksman existing, must inevitably do, if his gun throws the center of its shot under the visual line of aim) have been induced to entertain a mean opinion of themselves, in regard to their capability of learning the art of aiming right ; and have suffered that aspiring and protrusive spirit with which they were actuated at their initial into the practice of shooting, to be depressed and cowed ; so that instead of engaging the birds with an intrepid

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confidence, they have engaged them with diffidence and despondence. But the sportsman should not suffer his unsuccessfulness, in shooting to flatten nor deject his spirits when he engages his bird, nor make him dubious of hitting it : missing, if it be forty times successively, should not dishearten him, nor make him relax his attention from the pursuit of his sport, nor induce him to harbour a mean opinion of himself, in respect to his capability of learning the art of hitting ; for you may depend upon it, that, as long as you engage your bird with a vapid or desponding spirit, a slack attention, or a doubtful opinion of your capability of bringing it down, you will not shoot well. Confidence, perseverance, and a keen attention, are most essential requisites, or constituents in a marksman.

In short, no sportsman can shoot well with any gun, even if it be made upon the very best principle, unless he inherits those qualities.

I cannot find an epithet sufficiently expressive of the extravagance of the gunmaker's error, in filing down the upper part of the breech of the  
bar-

barrel, and leaving the muzzle swelling out to a magnitude much superior to the middle part : and in encreasing that protuberance by folding on upon it a lump of brass, iron, or some other metal ; what ideas they could have of shooting flying, or what their design could be, in projecting and effecting such preposterous mechanism, I cannot conceive.

If the residence of the winged species, which are the objects of our sport, in shooting flying, was somewhere in the upper regions of air, and were they only occasional visitants to us : and made their egress and regress to and from the earth, at such hours and seasons, that we could not get shot at them at any time, but when they were descending from their supernal abode ; and was the order of nature so far inverted, that our atmosphere attracted the shot from the earth, instead of depressing it to it, then guns fabricated on the beforementioned preposterous plan would be useful : you would then find ~~the~~ utility in a very crooked stock and a long barrel, a protuberant muzzle and a large sight upon it ; and you would likewise find utility in having the upper part of the breech filed down thin. But as long as the winged species of game continue



tinue their ubication on the surface of the earth,  
 and as long as the marksman is compelled to  
 shoot at them as they are ascending in lines  
 from it, and as long as the terrestrial atmosphere  
 retains its present inherent virtue of depressing }  
 or impelling all material substance towards the  
 original center of gravity, you will find it neces-  
 sary to have your gun stock made with a mode-  
 rate flexure, and your barrel of a moderate  
 length ; and instead of having the upper part of  
 the breech filled down, you will find it neces-  
 sary to have it left much thicker than the sides  
 and under part ; and instead of having the  
 muzle of your barrel swelling to a magnitude  
 one third more in diameter than the middle  
 part, and having the extuberant substance of the  
 upper part of it increased with an accertion by  
 ferrumination, till it is superior to the breech  
 in thickness, you will find it necessary to reduce it  
 by filing to the tenuity of a much worn  
 shilling, and have it less in diameter than any  
 other part of the barrel. Your barrel cannot be  
 filed away too much nor made too thin and  
 small at and towards the muzle,

A protuberant muzle often causes the fly-  
 ing marksman to miss his bird by shooting on

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one side of it as well as by shooting under it; especially when the bird flies off from him in a right line, upon the horizon; for when you engage a bird flying in that line of direction, you do not always take your observation or aim at it from the upper part of the muzzle, neither are you at all times capable of bringing your gun to bear with that precision on a bird flying in the beforementioned direction whilst it is within the reach of your shot. You as often take aim at a bird flying in a right line before your gun upon the horizon, from the right or left side of the muzzle as you do from the upper part of it; and, as there is an avidity in the marksman's eye, to have all volant objects full in view, when he is levelling at them, it is two to one that he sees the whole body of the bird clear on one side or the other of the muzzle of his gun, when he pulls; and if so, it is ten to one that he misses with a gun that has a protuberant muzzle.

There can be but very little probability of your hitting such bird, when the protuberance of the muzzle throws your visual line of aim and the center of your charge so much divergent (as many muzzles do when you take aim from either  
side



side of them) that there is no interfection nor pertinency with the range of your shot and visual rays; if your charge of shot do not, in its spreading; intersect nor touch the visual line of your aim, it cannot environ or hit the bird you aim at, when flying in a right line before you.

It is very difficult to bring a gun to bear on a bird flying in a direct horizontal line from you, with such strictness whilst within the reach of your shot, as to have the center of the upper part of the muzzle pointing strait at it, unless you throw it to that point in putting your gun to your shoulder. It is much more difficult to bring your gun to bear, after it is at your shoulder, with a strict aim at a bird flying rectilinear upon the horizon before you; and more difficult to retain your aim good, than it is at a bird flying in a direct line from you, elevating to twenty or thirty degrees; because, you cannot command your gun with so much ease, nor hold it so steady to a point, when you present it level with the horizon, as you can when the muzzle is elevated a few degrees above the horizon. The more the muzzle of your gun is elevated, till you collineate five and thirty or forty degrees, the easier you can command it and the steadier

steadier you can hold it, and the easier and quicker you can recover lost aim or bring your gun to bear with the center of the upper part of the muzzle levelled full upon a bird flying in a direct line from you.

But there would be no species of necessity for confining the marksman to such strictness in aiming, as to take his observation from the center, nor from any part of the upper side of the muzzle, were the muzzle of a right shape and size. If the muzzle of your gun is taper and thin as it ought to be, it matters not whether you take aim from the upper part or from either side of it.

The muzzle of your piece should be made as thin and as small as it can be made, in order to bring your visual line of aim, when taken from either side of it, and the center of your shot as near as possible to a convergent point or concourse at its appulse to the object you shoot at.

It is obvious to the eye of common perspicuity that the nearer your visual rays are brought to the center of the tube of your gun at the muzzle, when your aim is taken from either  
side



side of it, the nearer the center of your shot must be to your visual line of aim at its ap-pulse to the object you aim at ; and if the center of your shot be near your visual line when you shoot at a bird flying in a direct line from you, it consequently will be near the bird, if you hold your gun with rectity ; and it must be allowed, upon all hands, that you have a much better chance of bringing down your bird, when the center of your charge is thrown full upon it, or near it, than when your shot is thrown so, as for the bird to be remote from the center of it and only environed with a few straggling particles, near the extremity of its expanding circle.

A bird that gets up near unto the marksman and flies in a direct line, elevating between twenty and five and thirty degrees, should be the easiest mark of all flying objects, for him to throw the center of his shot upon ; and it certainly would be an easier task for him to throw the center of his charge upon a bird flying in a line as abovementioned, than upon one flying in any other line, were the muzzle of his gun thin and slender : and those birds that fly off from the marksman in right lines upon the horizon

gon which are as often missed as those that fly in the most amfractuous lines would be easy encompassed near the center of the shot were the muzle slender and taper.

But as long as sportsmen make use of guns that have the least protuberance, or prominence at the muzle, they will miss birds flying in right lines from them oftener than in any other lines of direction ; particularly those birds that have their celerity increased by the wind, or by descent in flying from the summit of an hill down its declivity.

For when a bird flies in a strait line, from the marksman, upon the horizon; with a brisk wind, or from the summit of an hill sweeping the surface in a direct line, towards the foot of it, it gains ground so fast from him, that it is almost impossible for him to make any strict disposition with his gun, in aiming, whilst the bird is within reach of his shot, except he does it in the action of putting it to his shoulder, or instantaneously as it is at his face.

Therefore sportsmen should not be confined to such accuracy in taking aim as the protuberant



ant muzzle requires. They should not by any means, be constrained to take observation or aim from the upper part of the muzzle; their aim should be sufficient and good, at birds flying in the beforementioned direction, as soon as they could bring their gun to bear, so as for the superficies of any part of the muzzle to range with their visual rays in a point to the bird.

I could here recite a long chain of enormous inconveniencies that a protuberant muzzle puts the marksman to, in taking aim at birds flying in transverse, oblique and curved lines of direction as well as in right lines from him.

But, as I think what I have already said about it will be sufficient to give my readers a true light of it; I shall proceed with observations on the weight, length and strength of gun barrels and on the size of bore, and length of the stock in the but.

OBSER-

## OBSERVATIONS.

THE barrel of your gun should not exceed three foot and two inches in length; for whatever a barrel measures above that length is supervacaneous and unweildy; it is supervacaneous because a gun three feet two inches long in the barrel, will kill a bird when it is within the latitude of shooting flying equally as well as one four foot long, and if you go into extreme lengths, or to lengths beyond the common distances of shooting flying, the barrel which measures the three foot two inches will kill a bird at as great a distance as the four foot barrel, with the proviso, that the barrel which measures the three foot two inches has the same weight of iron in it, and is the same size in the bore, and the iron in it be disposed in the same proportionate manner as in that of four foot long. If the longer barrel is not superior in weight as well as in length it will not kill one  
inch



inch further than the shorter barrel; and a long barrel is so notoriously cumbersome in shooting flying, that I think there is no occasion to say any thing more about it, than that it is so.

You should not chuse a gun too heavy for the power of your arm, for that will make you shoot under the mark, either flying or fixed; tho' a thick heavy barrel will throw shot with a greater velocity than a thin light one; for when a barrel is very thin, it distends in the action of firing, and that distension diminishes the impulsive force of your powder, and consequently makes the velocity of your shot languid, or much less than it would be, with the same charge of powder, from a barrel strong enough to bear the action of firing without stretching.

Observe, when you chuse a barrel, whether the substance of iron in it be properly disposed; for gunmakers have, many of them, been very disproportionate in the disposal of the iron in great numbers of their barrels: they have left a very thick mass in the breech, and filed the middle part till it is as thin as a wafer; and have,

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in making a childish ornament, resembling a bead, cut many barrels pretty near through, in a part which is as much strained in the action of firing as the breech itself. This puerile ornament and thin filing on the middle part of the barrel is, as I have been told, by several gunmakers, to make it handsome; the consequence of which is frequently bursting as well as languid shooting.

It is a folly to load yourself with a thick mass of iron in the breech of your gun, when the middle part is very thin, because it will not shoot one bit the stronger, for being massy at the breech, if there is not substance of iron in proportion to it in the middle part,

The ideas that some gunmakers have of the beauty of gun barrels, are certainly most ridiculous. For why should a gun barrel be handsome in being very big at the breech and muzzle and small in the middle.—Why, because some whimsical barrel filer took it in his head that it was so, and custom hath made it so.

For my part, I ever thought the barrel handfomest that were shaped best for business:

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I always thought the barrel handsomest and best made that would throw shot thickest and with the greatest velocity ; and the center of its charge nearest to the marksman's visual line of aim at its appulse to the object aimed at. Shooting thick and strong, and throwing the center of the charge near to the visual line of aim at its appulse to the object, are the most desirable and most principal properties of a gun barrel.

But the sportsman must not think of meeting with these eligible properties in concomitance with a thin filed middle and swelling muzzle : they are not to be found in any barrel but that which is stout in the middle, and is made with an even decrement of substance from thence to the end of the muzzle.

The bore of your barrel should not exceed the size called fifteens (as much narrower as you like) that is a bore wide enough to take a leaden bullet of fifteen to the pound. There is not the utility in a wide bore as some marksmen conceive. Many sportsmen chuse a wide bore because it will carry more shot and spread it to a wider extent than a narrow one ; imagining that  
they

they gain an advantage from the great expansion of the shot. But this is a mistaken notion, for a barrel must have magnitude in proportion to its bore ; and the muzzle of a barrel with a wide bore, will cover a space proportionate to the spreading of its shot. The larger the barrel, the farther your visual rays, when aiming, must be from the center of the tube at the muzzle and consequently the further from the center of your shot, at its appulse to the object you aim at ; so that the magnitude of your barrel takes away all the advantage supposed to be gained from the spreading of its shot. If you take aim at an object, with a barrel of an inch bore so as to see it above or on either side of the muzzle, the same as with a barrel of half an inch bore ; the object will be as near to the extremity of the circle of your shot, when you shoot with the inch bore (notwithstanding its load being double in quantity and expansion of shot double in diameter to that of the half inch bore) as when you shoot with the half inch bore ; and the very same error or variation, at the muzzle from your line of aim, on either side or under the object, that will cause you to miss with the half inch bore will cause you to miss with the inch bore. So that if you take aim, and hold  
your



your gun in a position to see the object, according to the common mode of aiming, you will be as certain of hitting it with a gun that has a narrow bore (provided the muzzle be not protuberant) as with a gun with a wide bore. I must allow, that a wide bore is best for those sportsmen who shoot without taking aim; and a wide bore is better than a narrow one, for a marksman whose eyes are in a defective state; and it is likewise better than a narrow one for those sportsmen who never make use of their eyes when they fire at the bird.

But if caligatio be not the case with the sportsman's ocular faculty, and he employs it as a marksman ought, when shooting, he will find that a gun with a narrow or moderate bore is superior to one with a wide one, both for readiness in catching aim, and certainty of hitting the object of his aim. Could matters be so concerted, that you could bring your rays of vision so near to the centre of the wide tube at the muzzle, when taking aim, as they are to the center of the narrow tube, when aiming; you would then gain an advantage with the wide bore from the spreading of its shot. But as long as you are constrained to take aim from the exterior

part

part of the barrel with a wide tube, in the same manner as with a barrel that has a narrow one, you will find no availment from the expansion of its shot. But admitting this ideal advantage of the spreading of your shot to be really existing; even then, this advantage would be no ways sufficient to counterpoise the train of inconveniences annexed to a gun with a wide bore.

In the first place, a barrel with a wide bore must have weight of iron in it, in proportion to the dimensions of that bore; which will make it burdensome to carry, and oppress your arms to hold it in a shooting position, except you are provided with a fulcriment to rest it upon; in the next place, it will constantly consume abundantly more ammunition than a barrel with a narrow bore: in the next place, a wide bore never throws shot with so great a velocity as a narrow bore; and there is another article, which is a very disagreeable and dangerous one: all guns that have a wide bore, recoil greatly in firing, if they are loaded with a sufficient quantity of powder and shot to do execution at any moderate distance.

But



But of whatever size you chuse your bore, have your barrel so shaped, as to throw the center of its shot, seven or eight inches above your visual line of aim at thirty yards distance.

It is absolutely necessary that all guns, which are made for shooting flying, should throw the center of their shot a considerable distance above the visual line of aim at the abovementioned distance.

If birds never elevated in their direction, but always flew in lines parallel with the horizontal plane, it would be necessary that your gun should throw the center of its charge four or five inches above your visual line at thirty yards distance, for the several following reasons.

First, because you very frequently see the whole body of the bird clear above the muzzle of your gun when you pull:

Secondly, because your shot fly in an ellipsis and extend its excentricity from the vertex downwards and fly thicker below the center of the ellipsis than above it:

And

And, thirdly, and lastly, because you always let the muzzle of your gun sink down when it hangs fire, or if your nerves are affected with any tremor or vellication when you pull.

You never lift up your gun at the occurrion of the incident of hanging fire, nor at the interposal of the defect of trembling or twitching of the nerves ; tho' it appears to an unexperienced eye, as if the piece mounted : because the marksman, in the recurvity of his body, with the recoil of the gun, at the disposure of its charge, some times lifts his hands up ; but that sublation happens after the shot quits the tube of your piece and not before. Probably you will be desirous to know what it is that causes your shot to fly in an ellipsis, and the cause of its flying thicker below the center of the ellipsis than above it.

The causes are as follow : the particles of your shot, in its granulation, are not all formed orbicular and solid ; many of them are semi-globular, oveform, turbinated, cuspidated, cavous and otherways imperfect. Now when a charge of these multiform particles is discharged from your piece by the impulsion of your powder ; they all continue their projectile motion



tion of flight unto lengths and distances, according to their figure, weight and magnitude: the light, cavous, and otherwise imperfect grains fall or are depressed to the earth sooner than the round and solid grains are. These grains being, on account of their deformity, levity and imperfection, depressed in oblique lines towards the earth; while the globular and perfect grains continue permeating the air in lines more direct, form the ellipsis, and cause the shot to fly thicker below the center of the ellipsis than above it.

And there is another thing which often contributes towards making the particles of shot thickest below the center of its circle; which is this: Many barrels are opened, in the bore very wide at the breech end, in a conick form; and that cone, perhaps, terminates ten or twelve inches from the breech. The load of your gun being constipated with your rammer, on the base of the cone, your shot, when you fire, receive a very violent compression and affrication in passing through the contracture into the cylinder; which deform and diminish many of the particles.

This is demonstrable by the quantities of lead you will often find adhering to the contracted part of such barrels ; and a farther demonstration of it may be had, by shooting at some loam, stickt on a board, with some wool or tow under it, or between the board and loam, in which you will find the particles of shot in the same shape they quitted the tube of your piece.

As for your gun stock, touching its length in the but ; that must be left in a great measure to your own judgment, because every marksman ought to have the length of his stock proportionable to the length of his neck and reach of his arm ; and he should be as exact in fitting himself with a gunstock for shooting flying, as in fitting himself with the shoes he wears.

Tho' gun-makers seldom make any material difference in the length of gun stocks : they pay little or no regard to the corporal size, nor shape of their customers. They scarce ever make any distinction in respect to the length and reach of their neck and arms. The man who is six inches shorter in the reach of the arm than another



other shall have his stock of the same length in the butt as the longer armed man. The corpulent man, whose obesity renders him incapable of bringing his hands to meet before him, shall have his stock of the same length as the macilent man, whose macritude of body and procerity of arm enable him to clasp himself round with his own arms; and he whose stature is first in height in the whole town shall have no more length in his gun stock than the congeon of four foot high: so that marksmen of all shapes and sizes are fitted by the gunmakers with nearly one and the same length in their gunstocks. A Taylor or Shoemaker may, with as much propriety cut every suit of cloaths, or every pair of shoes of a length, as a gunmaker his gun stocks; and would fit his customers of all shapes and sizes equally as well with cloaths or shoes, all of a length, as the gunmaker fits his with gunstocks.

I have several times mentioned this error in the facture of gunstocks to gunmakers; some of whom told me, in reply, that it was a rule in their art, to make their stocks fifteen inches and an half long in the butt; and several of these mechanics strenuously insisted upon it (in  
spite

spite of all my reasonings in opposition to this general rule) that a stock fifteen inches and an half in the butt was a very proper length for any marksman to shoot with.

It is a capital fault to have your gun stock too long in the butt ; for when your stock is too long for the reach of your arm, you will find it difficult to present your gun without having the butt obstructed with the breast of your coat ; and when your gun is presented, you will be quite out of form and position for traversing it, and will be incapable of taking a quick, or an accurate aim at a bird flying, even in the easiest line of direction and with the slowest celerity.

It is likewise a great fault to have your stock too short ; for if your arms are much contracted when your gun is presented, you cannot have a sufficient purchase, with your trigger hand, to traverse it properly with the speed of a bird flying in a transverse or curved line, on your trigger hand, nor hold it steady in the action of firing.

The flexure of your stock should not much exceed two inches and a quarter. Two inches  
and



and quarter flexure is sufficient for almost any marksman, if he puts his body in a proper position when he presents his gun; though some sportsmen will tell you, that they cannot with such a bent bring their heads low enough, to take their observation from the breech of the gun.

But if such sportsmen would, instead of standing in a stiff and erect attitude, when presenting their piece, incline their bodies forward as when making a congee, and place the butt of the stock high enough against their shoulder, they would not find any difficulty in bringing their faces low enough to take their observation properly.

The more the flying marksman inclines his body forwards, in moderation, when he presents his gun, the more pliant and versatile he will be to the flexions of a swerving bird, and the more capable of traversing his gun with the celerity of one flying in a regular transverse or curvilinear direction.

No marksman can encounter the anfractu-  
osities of birds that swerve in their lines  
after

after he has engaged them ; nor take aim with precision at those which fly in the most right and most facile lines for hitting, if he presents his gun and engages the bird in an erect attitude. Wherefore you should chuse your stock with such a flexure as would admit of your presenting the gun in a bowing attitude.

When you chuse a gun lock, you should not have the springs too feeble, nor omit examining the main spring and hammer spring, in order to see if their elastick power bears a due proportion, one with the other : that the resistance of the hammer may be exactly suitable to the stroke of the cock ; for if these two springs are not proportionable in strength and elasticity, your lock will not operate well, nor be certain of firing your prime ; and you should be ever mindful that you do not have your lock made to go off too easy ; for if your lock goes off with an easy pull, it will be often brought to action, whilst you are endeavouring to bring your gun to bear on the bird, and sometimes before you have the butt to your shoulder ; and you will often miss by firing before you have made your aim good, and before your gun is in a proper position for shooting.

If



If you make use of twenty different guns, you should have all their locks made, if possible, so as to require exactly the same pull, one as another, to bring them to action. There is nothing deceives, nor disconcerts the marksman more than the change or variety of locks; shooting on one day with a lock that goes off with a slight touch; and shooting on another day with one that requires an hard pull to bring it to action, will cause the most expert marksman to miss his bird very often. If his change be from the stiff going lock to the easy going one; he will then, with the action he used in common on the trigger of the stiff going lock, in the motion of presenting and action of aiming, involuntarily bring the easy going one to action; and if his mutation be from the easy going lock to the stiff going one; he then carrying on his finger a sense of the palpation he was obliged to use on the trigger of the easy going lock, will not be capable, or will not think of giving so hard a pull, as the stiff going one requires to bring it to action; so that he loses his aim and misses the bird, because his lock did not juncturely answer his pull.

While

While you are investigating the mechanism and operation of your lock, you should be strict in observing whether the trigger requires a long pull, or not, to bring the lock to action ; what I mean by a long pull, is when your trigger yields or comes back a great way, with your finger, like a lever with a short purchase; and if you find that it requires a long pull to bring the lock to action, you should not attempt to shoot with it ; for a long pull will deceive you, and cause you to miss your bird very often.

There is a very near affinity in a long pull and hanging fire ; and it will puzzle the judgment of any marksman to determine which of the two is the most detrimental, or will cause him to miss the bird ofteneft. A short pull, as well as a tolerable strong pull, is that which every marksman should chuse for shooting flying.

At all times of your taking a gun in hand, you should accustom yourself to hold and carry it in a safe and likewise ready position for presenting ; that you may be expedite, when occasion requires it, in engaging your bird, and that yourself, and people about you, may be  
secure



secure from danger, if it should at any time fire by accident in your hands.

Holding and carrying the gun in a safe position, and well securing the lock, are the first articles that a young sportsman should learn, and those articles are so very essential, that they ought to have a greater observance and more attention paid to them than all others in or belonging to the whole practice of shooting; and every sportsman should, in his training and proficiency, confine himself to the most rigorous strictness in his forms and positions of handling and carrying his gun, and securing his lock, till it became as it were natural to him to well secure his lock and hold and carry his gun in a safe position.

The result of omitting or neglecting an observance or performance of any other article belonging to the practice of shooting, is generally no more than missing the object of your aim. But the neglect of securing the lock, and carelessness and awkwardness of form of handling and position of carrying the gun are often attended with the most melancholy catastrophes.

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This observation is every shooting season verified by the loss of limbs and lives of many people.

When you are carrying your gun in the field, in pursuit, or in expectation of game, cock your lock, and place the thumb of your trigger hand upon the cock, and your fore finger upon the trigger: and lay hold of the gun with your other hand a little before the guard; then, if your right hand be your trigger hand, raise the muzzle of your gun upwards, pointing obliquely, about the midway between your left elbow and left cheek; and at the same time place your hands so high against your breast, as to form a square with your elbows; and let your hands lie close against your breast.

This is a very safe and ready position for presenting. In this position your gun cannot do any damage if it fires in your hands ever so often by accident; and from this position you will be able to present your gun with more ease, more expedition, and with more rectity, than from any other position whatsoever. In this position your thumb and trigger finger  
fit



fit easy and firm in their places, on the trigger and your cock ; and your hand has the easiest and greatest command over your lock, in cocking and securing it, that it possibly can have.

Beware of carrying your gun with its muzzle hanging downwards ; for that is an awkward and dangerous position ; and has been the cause of bursting more barrels than any one thing besides ; for when you carry a gun in that pendent position, your shot is apt to force its way from the powder ; especially if your barrel is clean and glib on the inside ; and if it so happens, that the charge of shot forces its way, sixteen or eighteen inches from the powder ; and you present your gun from the beforementioned pensil position and fire it off, with its muzzle pointing below the horizon, it is ten to one that you burst your barrel.

There are other perilous consequents that await carrying your gun in the beforementioned pendant position, besides those that generally attend a disruption of a barrel : the men, horses, and dogs that are with you, are in perpetual danger of being shot all the while you carry your gun pointing below the horizon.

Ob-

Observe when you secure your lock, by uncocking it, (which you should always do before you go through or over an hedge, gate or stile) that you let the cock go on, under the guidance of your thumb, towards the hammer, till it is over the half bent hitch; then pull it back again to its half bent hitch; and if you then hear the lock click, you may let it rest as secure; if not, try it over again; and always give your trigger a pull, to see if it is secure: and whether you have company with you, or not, remember that you, at your going over or through an hedge, gate, or stile, carry your gun with its muzzle pointing as near as you can to a perpendicular line.

Sportsmen are divided in their sentiments in regard to the management of their lock, when in the field, in pursuit of game, some contend for carrying it cockt, others for carrying it uncockt.

For my part, I generally carry my gun with its lock cockt: my reason for it is, because I would not have too many manual motions to make in preparing to engage the bird, after it is



is upon wing; well knowing that if the markf-  
man hath the motion of cocking, or any other  
manual motion to make, after the bird is up,  
prior to the motion of presenting his gun, that  
that motion will disorder and retard his motion  
of presenting and impede him in the action of  
engaging and aiming.

Besides, I know that the attention of every  
keen sportsman is so amply employed about the  
motion, distance, and direction of the bird, that  
he will often forget the motion of cocking and  
engage his bird with the lock uncockt. I have  
been many times present at the intervention of  
this balking incident.

But, notwithstanding the frequent occurrence  
of this disappointing circumstance; and notwith-  
standing the impeding effects of the disordered  
motion, excited in the marksman's motion of  
presenting, by cocking his lock, and recover-  
ing his gun from ungain positions after the  
bird, he is to engage, is upon wing, many sports-  
men earnestly insist upon it, that there is no ne-  
cessity for carrying your gun cockt, nor for car-  
rying it in any particular form or position for pre-  
senting

senting (especially, say they, when you are equipt with staunch pointers or flushers.

But I shall take the liberty to tell those sportsmen, that they are misled, and that their persistence in such notions betrays ignorance both of the theory and practice of shooting flying.

Could the marksman at all times have notice of the birds, from the standing of his pointers or challenge of his flushers, previous to their springing or flushing, I should allow that there was no necessity for carrying his gun cockt, nor for carrying it in any particular form or position for presenting; and think it soon enough for him to cock his lock, and otherwise order his gun for presenting when his dogs gave him the before-mentioned notice of game.

But as there are generally as many birds spring, within shot of the marksman, unawares, spring without any preceding notice from his pointers or flushers, as from their pointing and challenging; and as these birds frequently get  
up



up at such distances, as will not admit of much time being spent, in preparing to engage them; and fly in such directions as require the greatest attention and steadiness to catch aim at them, I cannot help insisting upon it, that there is a most pressing necessity for the marksmans carrying his gun cockt, and in the most ready position for presenting.

Some sportsmen will tell you, that cocking the lock cannot properly be called a distinct motion; because, say they, it may be cockt in the motion of presenting.

I know that the motion of cocking may be performed in the motion of presenting; but I want to know, who it is that can do it in the motion of presenting, without disorder in that motion: who it is that can, when the bird he is to engage gets up unawares, cock his lock in the motion of presenting at that bird, without disordering and retarding that motion.

I have often heard marksmen talk of doing many things after a bird is up, before they engage it; such as recovering their gun from off their  
 shoulder

shoulder, from under their arm, from behind their back: also laying their gun upon the ground and taking it up again; taking their snuff or tobacco box out of their pocket and taking a pinch of snuff, chew of tobacco, &c. but I never yet saw, nor heard of any one of these dexterous sons of the trigger, that could perform either of the beforementioned manoeuvres, between the time of the birds springing and his presenting the gun at it, without carrying with him a very apparent disorder in the motion of presenting; and such a disorder, that would cause him to miss much oftener than kill.

A sportsman may as well say, that he can present his gun with good order and take aim at a bird with rectity on horseback, when the horse is in a swinging trot, as to say he can do it when he has either of the beforementioned manual motions to make, after the bird he is to engage is upon wing.

I do not pretend to say, but that a sportsman, who engages a bird on the back of a horse in full trot, would be disordered in his motion of presenting and action of aiming, in a greater de-



